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Capitol renovation reaches a turning point

After all the tearing away, it is now time to start adding the first quake-safe footings

By Matt Canham
The Salt Lake Tribune

Think of a series of jacks supporting a car that weighs 138 million pounds. That's the state Capitol right now, and it doesn't need a simple tire change - it needs 265 earthquake-resistant stabilizers.

Crews are expected to install the first stabilizer today, marking a milestone in the \$200 million renovation project and the start of a yearlong seismic retrofit that will ultimately allow the symbol of state government to withstand a 7.3-magnitude quake.

But until all of the stabilizers are in place, the Capitol reconstruction is entering its most dangerous phase. The 90-year-old structure would suffer serious damage if an earthquake shook Utah while the building is being supported only by temporary props.

Engineer Jerod Johnson calls it the "window of vulnerability."

Johnson's crew has designed a plan to strategically install the stabilizers - which they call base isolators - to provide the most support.

They are called isolators because they actually isolate the building from the earth. They will sit on a new slab of concrete that will cover the entire footprint of the building. On top of the isolators is a series of concrete beams that are connected to the columns holding up the Capitol.

The isolators resemble a large layer cake, but instead of frosting and pastry, it is made with rubber and steel. They are 4 feet wide and 20 inches deep. And once in place, the building could sway as much as 2 feet in any direction.

To allow for such movement, construction crews will create a 3-foot underground moat around the building that will be covered with steel, earth and grass.

Johnson equates the entire stabilizing system to a common motor mount, which absorbs the vibrations of an engine without shaking the entire car.

Few buildings have such seismic protection. The first historic building in the nation to sit on the rubber and steel drums is the City-County Building in downtown Salt Lake City, which rests on 447 isolators installed in the late 1980s.

The considerable weight of buildings like the City-County Building and the Capitol is part of the reason the isolators work. The weight stops most up and down movement but allows for side-to-side sway.

Johnson says if a building of similar size to the Capitol were built today, it would weigh less than half its 138 million pounds. Once the inside is completely refurbished in late 2007, the building will weigh close to 165 million pounds.

The Capitol architect, David Hart, looks at Friday's installation of the first isolator in a philosophical way.

He says it is "the first opportunity to put something back, rather than all of this effort to take things away."

Since September, construction workers have gutted the building. But the seismic retrofit starts the effort to restore it.

So far, Hart reports that the project is a little ahead of schedule and on budget. "By and large, things look great."

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